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[REPRINTED FROM THE NEW YORK JOURNAL OF GYNÆCOLOGY AND OBSTETRICS FOR SEPTEMBER, 1893]

THE PREVENTION OF PUERPERAL SEPTICÆMIA

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NEW YORK
STUYVESANT PRESS
154 AND 156 WEST TWENTY-SEVENTH STREET
1893

[Reprinted from the New York Journal of Gynæcology and Obstetrics for September, 1893.]

THE PREVENTION OF PUERPERAL SEPTICÆMIA.

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The history of puerperal septicæmia is one of the most interesting and important in gynecic literature.

This is necessarily so, from the universal liability to its ravages and the suffering and mortality it occasions. The record it has made in lying-in-hospital and in private practice is appalling, and a proper study as to its prevention, involves some consideration of its causes. The facts concerning its genesis were long delayed, but the researches of modern pathology has portrayed it in its proper relations, and the clear light of to-day regarding its ætiology is in marked contrast with the suppositions, crude speculations, and erroneous opinions, which have held sway until within the last two decades. This uncertainty has been dissipated by the promulgation and demonstration of the truth of the germ theory of zymotic disease. Fifty years ago in Philadelphia, there occurred in the practice of Dr. Rutter, a series of cases of puerperal fever, which left on the minds of the medical profession a conviction of the communicability of this disease through contact. It would be interesting to examine the theories and views of such names as Eismann, Simpson, Semmelweis, Koch, Virchow, Pasteur, Winkel, Orth, Haussman, Hewitt and others of Europe, and Holmes, Barker, Lusk, Thomas Harris, Garrigues and others of the U. S., and trace the successive steps which led up to the discoveries with which the obstetrician is now familiar, which we may justly regard as one of the crowning glories of scientific and pathological investigation; but the limits of this paper will only allow reference to them incidentally. The efforts of Semmelweis to connect the manifestations of puerperal septicæmia with poison from the dissecting room, increased the desire for an authentative solution of the question, while in the same connection Lusk satisfied himself that personal dissinfection removed the risk of such infection, and gives emphasis to the views of to-day, that puerperal septicæmia is a preventible disease. General pathological research along these lines has contributed to the demonstration of the

true cause of this disease. The term puerperal septicæmia, as here used, includes the several conditions known as puerperal fever, and embraces the manifestations of the puerperal state under the head of pelvic lymphangitis, cellulitis, peritonitis and peri- and parametretic inflammation, though it is not to be inferred that all forms of fever or pelvic inflammation during the puerperal period, are necessarily of such origin.

One peculiarity of puerperal septicæmia is that the constitutional disturbance is to a considerable degree independent of the extent and severity of the initial lesion, and that cases where the initial lesion is the most insignificant, the sepsis is sometimes the most severe and prolonged.

The most violent and protracted case of acute puerperal septicæmia I ever saw, in which recovery followed, was of this character. The case was extremely difficult of differentation and it was only after several days had elapsed, and repeated examinations had been made, that a minute area of thickening no larger than a dime was found in the right broad ligament. Among its various manifestations Garrigues mentions a rare form, which he describes as acute septicæmia, which results from the absorption of a poison of such extreme virulence as to overwhelm the system and death ensues from paralysis of the heart before sufficient time has elapsed for the appearance of visceral complications. Naturally efforts have been made and means adopted to prevent the developments of this disease, and with varying results. Since the days of anti-septics and aseptics much has been accomplished in this direction, and the results both in hospital and private practice, are to a large degree gratifying, but perfection has not yet been attained. Of this there is certainty, that antiseptic measures *alone* are not always availing. The results of such treatment have been reported by Jewett in the lying-in-ward of the Long Island College Hospital and his careful and scientific observations are both suggestive and instructive. To ascertain the relative results of antiseptic vaginal douching two parallel series of hospital cases were treated side by side. The disinfectant was administered twice daily during the post partem week. The thermometric lines were as follows: About seventy per cent. of the cases in which the douch was used the temperature did not exceed 99 5-10, while in all the cases in which the douch was not used the temperature was constantly below 95 5-10, so that the morbidity was less in the cases not interfered with. Jewett then stated (in 1884) that he had been compelled to relax his faith in the protective power of local

antiseptic measures, both in purturient and puerperal patient, and declares his belief, that they cannot be relied upon to procure immunity in the presence of septic surroundings, and that experience "emphasizes the importance of *aseptic* rather than antiseptic management of the patient." In a recent paper Garrigues refers in emphatic terms to reprehensible and unnecessary antiseptics, in midwifery, and after raising the question as to the propriety of giving antiseptic vaginal injection before labor, expresses his approval of using it only once, and not subsequent to labor, unless it had been necessary to introduce the hand into the uterus. He recommends a one per cent. solution of creolin, which is innoxious, antiseptic and lubricant. The conditions under which puerperal septicæmia developes are very diverse.

Sometimes it is apparently epidemic: I say apparently for it is difficult if not impossible to demonstrate that it is not transmitted by the obstetrician or midwife (except in infected surroundings) for it is certainly much more prevalent some years than others. Again Lusk points out the fact it is much more prevalent in the cold than the warm season. Certain localities in country places so far as known are exempt from it. During a term of thirteen years' observation in the interior of New York and Pennsylvania the writer of this paper never saw or heard of a single case of puerperal septicæmia and in many locations so far as can be ascertained it has never prevailed. This of course refers to typical acute cases. Some country practitioners, and I fear some of their city brethren, have no fear of the dread disease and consequently no strict antiseptic measures are adopted as a preventive, and in many localities in the country some believe none are required. No compunctions of conscience deter some of these practitioners from going from a case of erysipelas, diphtheria or scarlet fever, directly to the case of the parturient woman, though it is not to be supposed that this is of frequent occurrence. The inference seems positive that the conditions are unfavorable for germ development or else the germs are absent—hence the immunity. Certainly no practitioner in any of the thickly populated centers, with knowledge and conscience would venture to take such a risk. The diversity of views and consequent diversity of practice which followed the teaching of ten years ago have doubtless very largely grown out of the belief that the phenomena of labor was not altogether physiological, but that the rules which should govern its management were largely those accepted in surgical procedures. I shall enter into no argument to prove the fallacy of such a theory, and shall assume that normal labor is a physiologi-

cal process, and that so far as septic infection is concerned, it is with few exceptions due to external causes. The belief became fixed that the danger could be obviated by antiseptic measures directed to the maternal parts by douching, etc. So firm was this notion rooted in the professional mind, that this procedure became the keystone of their faith and practice, and this view is yet held but by diminishing numbers.

Thus immunity from the septic state—post partem, was regarded as due more to the thoroughness of such preventive measures, than the varying power of resistance to the poison by different individuals, or the avoidance of sepsis. The reaction from the fallacy of such views, made possible by a fuller understanding of bacteriology as related to the pathology and etiology of the disease, has opened the way to more rational and physiological methods of preventive treatment. It may then be confidentially affirmed that as healthy animal tissues contain no bacteria, puerperal septicæmia is caused by the introduction into the genital tract of specific micro-organisms, their multiplication and the absorption of such germs with their products, ptomaines and leucomaines into the blood of the patient. It is also demonstrated that these various micro-organisms are capable of culture, and that these cultures retain the same septic qualities as the original germs. In order of frequency and virulence they may be classified in the following order: First, streptococcus pyogenes—which is Fehleisens diplococcus of erysipelas. Second, staphylococcus pyogenes aureus found in ordinary pus. Third, staphylococcus pyogenes albus. Fourth, staphylococcus pyogenes citreus. Fifth, possibly bacillus pyocyneus and other bacilli. It also appears that these germs propagate rapidly in alkaline media, and it is believed after having found entrance to the genital tract, they only enter the system through a denuded mucous membrane or raw surfaces. In septicæmia pure and simple, the constitutional disturbance results, principally, though not necessarily entirely, from absorption of ptomaines and leucomaines, pyemia supervenes when these bacteria enter the blood, having found entrance to the veins, and thus distributed through the circulation, and whenever arrested produce new foci of suppuration and distribution. The methods of infection may be classified as external and internal, though in strict terms it may be declared that all pyogenic micro-organisms are from outside the system, and that true auto-infection never occurs.

First—Entrance may be gained by germs on the hands of the attendant introduced into the vagina or uterus. Second—germs

from clothing of patients or from other substances coming in contact with the patient, thus gaining entrance to the vagina, and third —entrance of air containing germs into the vagina and uterus— accidentally or otherwise, at, preceding. or subsequent to labor. Observation and experience confirms the belief that outside of lying-in-hospitals and infected apartments the most common source is from the finger or hand of the attendant during labor. The darkest pages of obstetric literature are those which record the spread of this disease in the practice of a single physician as traced from one patient to another. It was by such observations that the causes of its dissemination were established before its specific nature was known. Doubtless to-day, as in the past, the principal citadel and magazine of this poison is found on the hands of the obstetrician or on his instruments.

The remedy for this danger is simple and obvious. Not that cleanliness which would enable one person to say of another that his or her hands were not dirty, nor the conventional cleanliness which comes from ordinary washing with soap and water, but *surgical cleanliness*, which comes only from thorough use of soap and brush, followed by *suitable immersion of the hands for a proper period in a true germicide solution*—say 1 to 2,000 of bichloride of mercury.[1] That immunity from this disease was present even after less careful attention to such details should not be taken as an argument that they are not required, neither should it be inferred that failure to comply with them did not subject the patient to needless and culpable risk. Here pre-eminently the moral element which is reasonably presumed to enter into every professional act of the physician, surgeon, or accoucheur, should never be wanting. In these rules[2] of asepsis it should be insisted upon that all instruments and accessories which come in contact with the patient should be rendered aseptic, either by immersion in true germicidal solutions, or by the employment of dry or moist heat, and this rule should apply to the entire period of treatment be it longer or shorter. The clothing and apartments should be free from the suspicion of contamination.

As an accessory to the risk of puerperal infection the frequent examination of the patient per vagina during labor is greatly to be

[1] The germicides recommended for personal disinfections of hands would be (after thorough washing and scrubbing with soap and brush), solutions of Bichloride and Bin Iodide of Mercury, Acid Carbolic, Chlorinated Soda and Peroxyde of Hydrogen.

[2] These rules and suggestions relate particularly to the management of private cases, as the author has had no personal experience with lying-in-hospitals.

feared, and if suitable knowledge of the case has been obtained prior to this period the advantages will be obvious. Not only will no good be thereby attained, but a needless element of danger will be introduced into the case. The ideal confinement is the one in which there is such perfect relation between the relative size of the fœtal head, the diameters and condition of the maternal parts, the presentation and the adjustment of the vital forces, that labor is completed without any interference on the part of the attendant. The wise and beautiful provision nature had made to protect the parturient women at this juncture of her existence, should not be forgotten or ignored.

It must be remembered and insisted upon that normal labor in all that antedates and succeeds it, is a physiological process and that when this process is interfered with by some unnatural cause, trouble may ensue.

One of the physiological processes so vital to the safety of the parturiant state is drainage. Any deviation from its normal causes and duration, whether of mechanical, inflammatory or septic origin, is attended with risk, and should not be chargeable to any neglect of proper preventive measures. The dangers of the puerperal state would be vastly lessened in proportion as "meddlesome midwifery" diminishes.

If ever the old adage has weight and significance "that an ounce of preventive is better than a pound of cure," it is in the domain of midwifery.

The question as to the propriety of antiseptic vaginal douching, immediately preceding, during and subsequent to labor, which has long vexed the profession, is fast finding a solution. Except in cases of complication requiring instrumental or manual interference, as before referred to, and to another class of cases which will be mentioned later on, the concensus of opinion is adverse to its use.

Such use of antiseptics, beyond cleansing the external gentalia, is of doubtful expediency and an admission of our own distrust of nature and her wise arrangements and safeguards. The end sought, immunity from sepsis, will be best attained by aseptic rather than antiseptic methods.

There is, however, a class of cases, in which the patient is not in a physiological condition, which requires radically different management, viz:—Those in which the patient is already infected, having within it the tubes, uterus, vagina or in adjacent structure, directly connected therewith, specific, suppurative or malignant disease.

Under this head may be mentioned gonorrhœal poison, found any where from the introitus vagina to the free opening of the Fallopian tubes, suppurative disease of one or the other of the tubes emptying their contents into the uterus, or occasionally into the peritoneal cavity, or malignant disease of uterus, adnexa and of the vagina, accidental entrance of other poisons having their lodgement in the vagina, peri- and para-metritis, pus cavities communicating with the genital tract, and the various vesico-vaginal, recto-vaginal and other fistulæ, for it must not be forgotten that such conditions do not necessarily preclude conception. The recognition of such complications, prior to accouchment, is of the highest importance, and if overlooked serious and perhaps avoidable consequences may ensue. When sepsis after confinement is present, the question as to its genesis may be in doubt. If anti-partem examination was neglected and the attendant may reproach himself unjustly in presuming he was the carrier of the poison, without being able to prove or disapprove the ground of his suspicions.

So, too, such lack of positive knowledge will serve as an embarrassment in formulating and carrying into active employment rational and correct measures of treatment. While positive knowledge as to the method of invasion may not in all cases be a *sine-qua-non* to successful management, yet failure to observe such facts when the condition was due to causes within the patient, might and probably would defeat the end sought. The presence within the genital tract of disease may usually be predicted by the reaction of the secretions found in vagina. In the normal state the secretion of the vagina is acid and that of the uterus alkaline. If such secretion found in the vagina be alkaline or faintly acid in its reaction the presence of pathogenic germs may be inferred and appropriate treatment instituted. If such disease be found, either specific inflammatory or suppurative, during pregnancy it should receive prompt attention, and failure to do so might invite serious post partem trouble. If the disease be confined to vaginal walls treatment on chemical suggestions might be indicated, in which event solutions of lactic acid or boracic acid in appropriate strength would fulfill the indication, yet the difficulty of destroying certain micro-organisms in the vagina—particularly the gonococcus—must be acknowledged. Here, as elsewhere, the microscope may be of highest value in determining the exact character of the disease process. Again it is affirmed by experienced obstetrical teachers that the introduction of an aseptic finger into the vagina during labor may carry germs found in a normal acid secretion of the vagina, to the alkaline secretion of the cervix, and

that these germs may there develop and be productive of mischief, and the statistics of labors conducted without such examinations add weight to the assertion.

There are two rules as to the avoidance of puerperal septicæmia which should command universal assent:

First—A proper regard to nature and her laws as seen in normal parturition, and

Second—A rigid adherence to *strict asepsis.*